

JPI Oceans pilot action: Ecological aspects of deep-sea mining

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The Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans) is a coordinating and integrating platform for marine and maritime research and innovation, open to all EU Member States and Associated Countries. In 2013 the JPI Oceans Member Country representatives decided to launch a pilot action to study the long-term ecological effects of deep-sea mining. To realise this aim, the German Federal Ministry of Education and Research (BMBF) offered 118 days of on-site research on the recently inaugurated RV Sonne for two cruises in the Pacific. A group of international scientists under the lead of Matthias Haeckel (GEOMAR) and Pedro Martinez (German Centre for Marine Biodiversity Research / Senckenberg institute) subsequently developed a common scientific proposal for these cruises. For Belgium the Marine Biology Research Group of University of Gent and the Royal Belgian Institute of Natural Sciences are part of the research consortium.

The project started in January 2015 and will run for 36 months with an overall budget of approximately €9.5m. Over the course of the first cruise researchers visited various claims of European Countries in the Clarion-Clipperton Zone (CCZ). The second campaign visited the area off the coast of Peru at which German scientists in 1989 conducted the DISturbance and re-Colonization Experiment (DISCOL) to simulate and investigate the environmental impact of nodule mining. Researchers from eleven countries mapped habitats, studied deep sea ecosystems and investigated their functioning in addition to predicting and identifying the environmental implications of nodule and sediment removal, sediment plume dispersion and redeposition caused by mining activities. Following the cruises which were finalised in October 2015, scientists are evaluating the collected data on-shore in the participating institutes.

Preliminary results of the cruise show that the plough marks in the DISCOL area have hardly changed. Very little recolonization, low bioturbation and microbial activity was observed, implying that nodule mining will likely disturb the deepsea ecosystem for many decades. Numerous seamounts were also detected in the deep sea which may make it difficult to mine on large continuous areas. Finally, the cruise has proven that the technology to conduct Environmental Impact Assessments and monitoring is available.

As a next step scientific data analyses will be targeted towards formulating recommendations for deep-sea nodule mining. In addition workshops with policymakers, stakeholders, contractors holding exploration licenses and interested industry planning offshore mining activities will be organised to communicate the project results. Scientific data and results will be stored in public world-wide databases and will also be made available to the Legal and Technical Commission of the International Seabed Authority (ISA) to facilitate implementation into regulations.

Keywords: deep-sea mining; Clarion-Clipperton Zone; Mn-nodules